



1 May 2020

Landpro Reference: 18250
Council Reference: APP-20191021

Environment Southland
Private Bag 90116
Invercargill, 9840

Dear, Alex

Amendment to the Piobiare Homestead Dairy Support Area

Please find below the additional information required for the change in land area for Piobiare Homestead dairy support property.

The Applicant has changed the area of Piobiare Homestead dairy support property following the purchase of an adjoining piece of land that came to market during the consent process, this added area replaces the previously leased part of this dairy support operation. The new block of 27.4 ha replaces the 43.3 ha of the lease block in the original application.

The requested Land use consent activities remain the same. Updated nutrient budgets have been completed and are attached to this amendment for review. See following sections for additional information to support the amendment.

The area is now summarized in Table 1.

Table 1: Summary details of property.

Property Details:	
Property address	939 Lochiel Branxholme Road, Branxholme
Property use	Dairy Support Runoff
Property owner	Piobiare Homestead Limited
Legal description of wintering platform (new area <u>underlined</u>)	<u>Lot 1 DP 7335, Pt Section 13 & 14 Blk II New River Hundred</u> , Lot 1 DP 517446, Lot 2 DP 429633, Section 2 Blk III New River Hundred, Pt Section 3 Blk III New River Hundred, Lot 1 DP 12462, Section 2 Survey Office 385656
Property area	149 ha
Proposed winter grazing in-situ	18 ha of crop
Peak stock number on farm	885 milking cows and 220 young stock
Map reference	NZTM 2000: 1238402E 4864404N



Figure 1: Amended Piobiare property with new area shown in red.

1. Description of Existing Environment

The new area included in this Piobiare landholding is generally flat to gently rolling and is contained wholly within the Makarewa River catchment as is the rest of the original application. This new land sits alongside the the leased land in the original application that has now been removed.

1.1 Surface Water Resources

The Tomopokorau Creek continues to flow through the new part of the property, this waterway has already been described in the original application. Please see Attachment E of the original application for technical comment on the instream values and water quality, these assessments remain valid with regard to this new piece of land.

1.2 Groundwater Resources

The new area added is wholly located within the Lower Oreti GMZ under the RWPS and PSWLP. There is now no land withing the Makarewa GMZ. Within Attachment E of the original application, Mike Freeman has mapped the maximum nitrate nitrogen concentrations (g/m^3) measured since 2012 (i.e. after the ES mapped 2007-2012 record on Beacon. A full description of the state and trends of Groundwater Quality in the vicinity can be found in Attachment E of the original application.

1.3 New River Estuary

The waterways on the new area of property are exactly the same as those contained in the original application and discharge into the New River Estuary. A full assessment can be found in Attachment E of the original application.



Figure 2: Tomoporakau creek looking downstream (March 2019).

1.4 Soils and Physiographic Zones

The new area of land contains the same soils and physiographic zones previously addressed in the main application. Please refer to Table 11 in the original application along with the full descriptions of the physiographic zones. Those soils found in the new area of the Piobiare property are Dacre Edendale and very small area on the southern boundary of Woodlands. The physiographic zones are a continuation of the property in the original application being Oxidising – no variant and Gleyed – no variant.

Dacre Soils - have a deep rooting depth and high available soil water, although the rooting depth may be limited by poor aeration during wet periods due to the poor drainage and slow subsoil permeability. Texture is typically silt loam and topsoil clay content is 20–30%. The soils are typically stone free, although the moderately deep phase will have gravels between 45–90cm depth.

Edendale Soils - have a deep rooting depth and high plant-available water, meaning there is no significant physical barrier to root growth. The soils are well drained but the compact subsoil is slowly permeable, and may cause short-term waterlogging after heavy rainfall. Texture is silt loam in all horizons, with topsoil clay content of 25-30%. Edendale soils are typically stone free, although the moderately deep phases have gravels between 45 and 90cm depth that may restrict rooting depth and available water to moderately high.

Woodland Soils - have a deep rooting depth and high plant available water, meaning there is no major physical barrier to root growth, although high bulk density in the lower subsoil may restrict root penetration. The

compact subsoil is slowly permeable, and may cause short-term waterlogging and limit aeration after heavy rainfall. Texture is silt loam in all horizons, with topsoil clay content of 20-30%. Woodlands soils are typically stone free, although the moderately deep phases have gravel between 45 and 90cm depth that may restrict rooting depth and available water to moderately high.

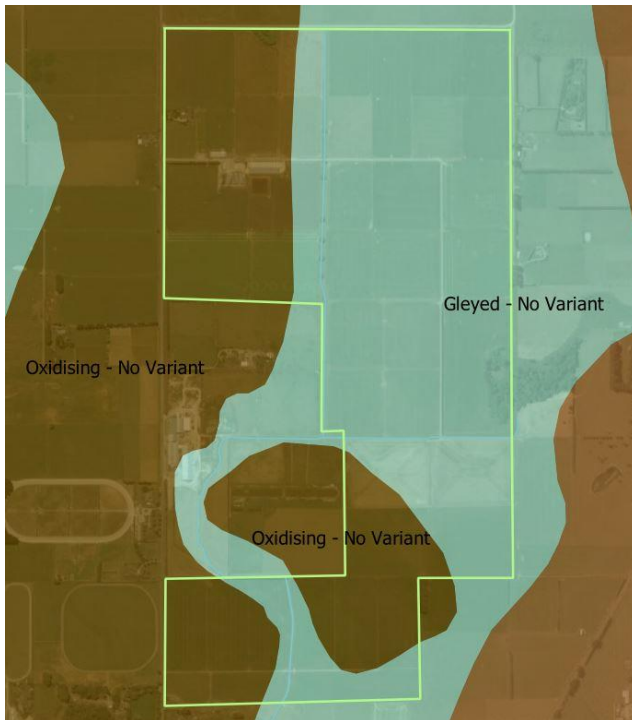


Figure 3: Amended Piobiare property showing physiographic zones overlaid.

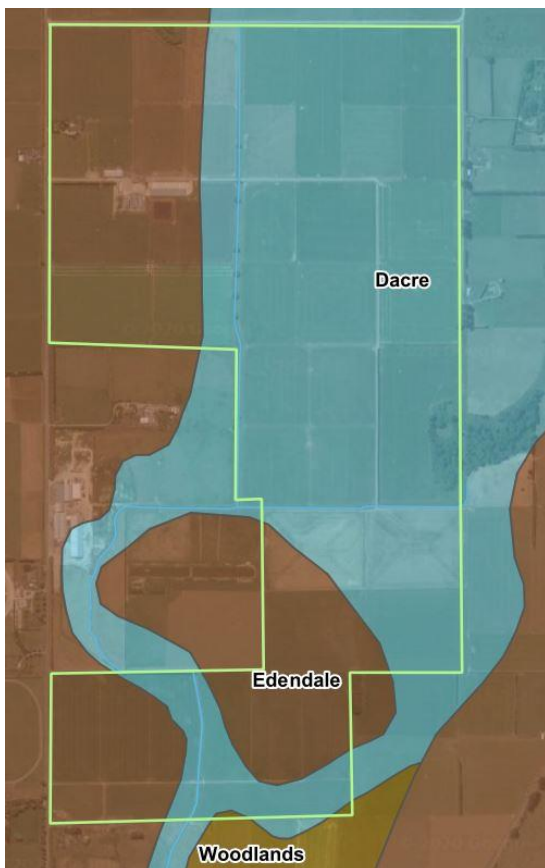


Figure 4: Amended Piobiare property showing soil overlaid.

2. Activity Classification and Consents required

The change in land area does not change the classification or the consents required, see original application for full details.

Overall, the proposal is for a **discretionary** activity

3. Assessment of Environmental Effects

The scope and scale of the assessment of the effects (AEE) of the proposal remain the same to what has been provided in the original application. The proposed change in the land area does not introduce any activities or matters that were not already considered as part of the original application, please refer to original application for the full AEE, but we have detailed any differences below.

The AEE describes the risks to the environment resulting from the proposed changes to the dairy support run off farming activity, including the wintering of more dairy cows from Aerodrome Farm Limited.

The original application outlines that the Aerodrome and Piobiare area separate landholdings, and whilst connected (in terms of trading stock), they are two separate operating units.

3.1 OVERSEER Nutrient Budgeting

OVERSEER nutrient budgets have been prepared by Mark Crawford of Ravensdown who is a Certified Nutrient Management Adviser (CNMA). These budgets have been used to show the annual amount of nitrogen and phosphorus discharged from the Piobiare landholding. A copy of the updated OVERSEER Nutrient Budget Farm Scenario Reports can be found attached to this amendment to the original application, (Attachment A). Access to the Overseer files will be provided to Council separately, as we note the original reports were independently peer reviewed by Arron Hutton CNMA and by Irricon as part of pre-application checks.

As contained in the original application the OVERSEER budget modelling of the current farm system, is an accurate description of the applicants' existing farm system and consequent N & P losses beneath the root zone as averaged over the preceding three years. All inputs into the model have been taken from three years of farm records and/or accounts and are actual figures and therefore fairly represent the scale of the farm system as it has been operating since 2015. Environment Southland as part of the original application have agreed that three years of averaged inputs would give them the most certainty of the existing farm system, and thereby existing environment and existing nutrient losses beneath the root zone based on the farm system inputs to the model. The following table presents the summary of overall N and P losses beneath the root zone for amended Piobiare property and replaces Table 22 of the original application.

Table 2: Summary over OVERSEER modeling.

Nutrient Losses	Combined Current Farm (149ha) System (3 Year Average)	Proposed Farm (149ha) System	Difference
Piobiare Homestead Limited			
N Loss from the root zone	5,723 kg N/year or 38 kg N/ha/year	4,275 kg N/year or 29 kg N/ha/year	- 1,448 kg N/ha/year - 9 kg N/ha/year
P Loss from the root zone	108 kg P/year or 0.7 kg P/ha/year	90 kg P/year or 0.6 kg P/ha/year	- 18 kg P/ha/year - 0.1 kg P/ha/yea

Overall, the amended proposal represents a decrease in total N losses by 1,448 kg N and a decrease in total P losses of 18 kg P. Also, the annual amount of nitrogen and phosphorus discharged from the landholding will be less than that which was lawfully discharged annually on average for the three years prior.

The key drivers resulting in the overall reductions of N and P loss at the farm scale for Piobiare as outlined in the original application in Table 23 remain the same and are outlined below for quick reference.

- Grazing on fodder beet crop
- Extended use of the wintering barn from May to September (modelled as a percentage of the herd and therefore likely to be modelling a 'worst case-scenario')
- Pastoral productivity which reduces the amount of N loss via tile drainage pathways
- No increase in young stock grazing
- Maintaining an appropriate effluent disposal area
- Slight reduction in stocking on pasture as a result of young stock changes and extended use of the wintering barn, mitigates the slight increase in stocking rate over winter on the crop blocks.

The above listed management changes are the key drivers that have ensured the proposed farm system overall does not result in more losses past the root zone than the current 3-year averaged farm system. The list above is not a complete list of all inputs, because it's the entire farm system overall that influences the predicted losses, but the key ones listed above are the most notable changes between the current and proposed farm system and are listed above to give Council some understanding as to why stock numbers are proposed to increase but that overall losses will decrease, this does not change with this amendment to what has already been detailed in the original application.

The use of a wintering barn is one of the most effective and significant mitigation measures available for NZ dairy farms for reducing effects of N leaching beyond the root zone through to groundwater and surface water receiving bodies. The wintering shed allows the applicant to remove cows from pasture and hold them inside during high risk drainage periods. In doing so, N deposited via urine and dung patches is collected within the effluent system and can be redistributed to pasture evenly, at a lower rate and timed to avoid high risk drainage periods. This significantly reduces the risk of N leaching through the soil profile as it is preferentially used in the root zone. The proposed changes with a small reduction in nutrient losses are highly likely to result in a very small contribution to improving water quality in the receiving waters. This has not changed from the original application.

3.1.1 Potential Water Quality Effects

There is no significant change to the assessment provided in the original application. The effects of the proposal remain the same to what has previously been submitted in the original water quality technical comment, being Attachment E of the original application. I repeat the conclusion for the benefit of quick reference.

"Our assessment is that the proposed farm system changes on Piobiare on their own will result in a real but extremely small overall improvement on local groundwater and surface water quality. Quantification of the improvement has not been completed because they are unlikely to be measurable with the current ES surface water quality monitoring programme at the local scale. Total nitrogen losses predicted will likely be less, particularly after further dilution, attenuation and dispersion processes (which have not been accounted for in the modelling). The proposal therefore meets Policy 16 of the PSWLP which requires farming activities to fully mitigate and avoid effects on the quality of water, including cumulatively, of groundwater, waterbodies, coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands. As a result, the proposal is likely to, at a minimum maintain water quality, and not further exacerbate cumulative effects on existing water quality in relation to dissolved reactive phosphorus, nitrate nitrogen, sediment or faecal indicator microorganisms.

Given that the proposal seeks to reduce nutrient losses by various farm system changes by virtue of the proposal itself, and then further seeks to reduce their likely effect on the environment overall, and that these mitigations

are specific to not only the activities themselves (the whole and each part) but also the water quality indicators of concern this proposal will result in a real but very small improvement in water quality overall.”

3.2 Mitigations and GMPs

The amended farm area does not seek to change those mitigations and GMPs listed in the original application. Please see Table 26 of the original application for an assessment of the potential effects of individual farm activities.

3.3 Broad Scale/Cumulative Effects Assessment

There is no change in our conclusion resulting from the proposed change in farm area from the original application being;

- That based on some specific farm system inputs and the implementation of proposed mitigations/GMPs the proposal will result in a reduction of contaminants in the receiving environments. Further, when considering the specific risks in each catchment. Specifically, for Piobiare the mitigations and GMPs proposed are exemplary (significant investment in effluent management, winter grazing strategies and winter barn infrastructure) and when the Consent Authority are able to set catchment limits, other users in the catchment would be able to look to this property as an example for how they can also contribute to the improved well-being and mauri of the receiving water bodies.
- Overall the proposal (modelled losses, and further mitigations proposed over and above that rewarded in OVERSEER®) will have a positive benefit on water quality at the local and catchment level. The improvements in water quality are real but will be difficult to measure at the catchment scale, or even attributed to the proposed changes to this farm system given the huge estuarine catchment area.

3.4 Summary

The proposal will result in a reduction in P, N, sediment and faecal indicator organisms lost to the environment and a concurrent reduction in the resulting concentration of these contaminants in receiving waters, albeit at an extremely low level. The overall effects on water quality will be positive and make a very small contribution to the existing trends of improving water quality at the local scale.

Overall the proposal will have positive effects on the environment. The mitigations proposed are not inexpensive and will require ongoing effort to monitor and manage on behalf of the applicant to ensure that they occur as proposed.

Preparation of the original application and investment in this new land area included in this amendment has required significant investment of time and money by the applicant and their advisors. This includes not only a number of site visits, sourcing and verifying all OVERSEER® inputs, testing of the effluent structures and visual inspections plus report writing. The application itself has taken over 12 months to prepare, and the applicant has made concessions in that the proposal represents a viable farm system but does not represent the best return of investment in terms of income. Other farm systems may be more profitable on this same land area but may have greater environmental effect and that does not align with the applicant’s values and vision for the property.

The continuation of the existing dairy support runoff block will enable the applicant to continue a sound but relatively secure farming operation, that is as close to a self-contained farm system as possible.

4. Other Assessment Matters

In accordance with Clause 7 of Schedule 4 of the RMA the original application contains a full assessment of the proposed activities effects on the environment, these have not changed with the amended farm area on Piobiare.

5. Assessment of Alternatives/Positive Effects

See original application, these have not changed with the amended farm area.

6. Statutory Considerations

Again, see original application, these have not changed.

7. Notification and Consultation

The original application was notified and there were no submissions received. The amended area does not raise any effects that have not already been considered. The only concern raised by the Council staff after notification was a potential cross over of effects arising from a historical discharge of Pypers Produce on part of the land. However, these concerns have been covered off when the Applicants purchased the amended area of land now to be considered as part of this application and Pypers Produce agreed to relinquish their rights to discharge on this property as evidenced in the letter now provided as Attachment B.

Therefore, given the scope of the effects have not changed through the amended area, we consider that the proposal may proceed non-notified.

8. Conclusion

The amendment to the farm area does not change our conclusions from the original application. The bottom line is that if the proposal is declined, real and actual improvements in water quality will not be achieved. The proposal is entirely consistent with all of the relevant policies, and a comprehensive assessment of the overall proposal and each component of the proposal has been undertaken. This complete assessment ensures that the effects of the proposal area known and anticipated to occur. The proposed conditions as contained in the original application are defensible, intra-vires, certain and enforceable.

Should the application for consent be declined the applicant will not only be unable to achieve environmental improvements, Council will have no recourse for ensuring water quality is improved at the local and catchment scale until the future anticipated limit setting process. The applicant is requesting their losses from the farm system will be capped at the levels proposed, so that they can sustainably, efficiently and profitably run their dairy farm and dairy runoff support blocks, whilst improving water quality.

Overall, the sustainable management of natural and physical resources is promoted; the effects on the environmental will be avoided and/or mitigated; the life supporting capacity of resources are safeguarded as far as can be reasonably expect at the consent level; and the use of the land and water resources are sustained so that they will continue to provide for future generations. Any decision to decline the consent, would be contrary to Part 2 of the RMA.

Please do not hesitate to contact me if any further questions.

Kind Regards



Walt Denley
Senior Planner
Landpro Ltd

Report

Baseline and Scenario Nutrient Budget

Prepared by Mark Crawford
Farm Environmental Consultant



PIOBIARE HOMESTEAD LTD - PYPER N A & R M

Branxholme Makarewa Road

RD 4

Invercargill 9874

Customer Number: 60827342
Date: 23/01/2020*
Reviewed by: John Holmes * (CNMA)



Executive Summary

Farm owners Nelson and Roseanne Pyper and Peter Moynihan have requested robust Nutrient budgets, for the purposes of providing information about the nutrient losses and environmental risks, for the property they have recently purchased (Lloyds Block of 27.4 ha) and how this will alter the current supporting information for a land use consent which Aerodrome farm is undertaking, and for which Piobiare is the dairy support block for this operation.

The farm is located at 939 Lochiel Branhholme Road RD 4 Invercargill and is approximately 15 km from the South west Coast. The new Lloyds block adjoins this block to the south. In a previous report submitted to council the total farmed area had been calculated as 165.1 ha, this being the Home block (121.8 ha) plus the Lease block (43.3 ha). The new block of 27.4 ha titled, with 25.8 ha being effective and the rest being riparian (0.6 ha) and non-productive (house and lanes), replaces the 43.3 ha which includes 0.9 ha FNO area of the Lease block.

The process of evaluating the effects on the environment with this change, is to calculate the effects from the current system (Home plus Lease block) and add this to the current effects from the new block purchased (Lloyds block). The present current budget plus the weighted average of the four yearly budgets of Lloyds block will show this (combined farm system). This is then compared to the budget and its calculated effects from the New proposed system. To do this Lloyds block is swapped for the lease block, with the farming system already reported and modelled essentially remaining the same.

From the information provided by Nelson, Roseanne on behalf of Piobiare Homestead Ltd, information from farm records, and the assumptions listed above, the N loss from the root zone and P loss to second order streams for the current modelled farm system is outlined below.

- The N loss from the root zone from the **current farm system (adjusted to new version)** was calculated using Overseer[®]FM 6.3.2 (2.9.4.10) to be **4,792 kg N/year or 29 kg N/ha/year**.
- The N loss from the root zone from the **combined farm system (adjusted to new version plus purchased block)** was calculated using Overseer[®]FM 6.3.2 (2.9.4.10) to be **6,701 kg N/year or 35 kg N/ha/year**
- The N loss from the root zone from the **new proposed farm system** was calculated using Overseer[®]FM 6.3.2 (2.9.4.10) to be **4,275 kg N/year or 29 kg N/ha/year, a 17 % reduction in N loss/ha**
- The P loss from the root zone from the **current farm system (adjusted to new version)** was calculated using Overseer[®]FM 6.3.2 (2.9.4.10) to be **121 kg P/year or 0.7 kg P/ha/year**.
- The P loss from the root zone from the **combined farm system (adjusted to new version plus purchased block)** was calculated using Overseer[®]FM 6.3.2 (2.9.4.10) to be **133 kg P/year or 0.7 kg P/ha/year**.
- The P loss from the root zone from the **new proposed farm system** was calculated using Overseer[®]FM 6.3.2 (2.9.4.10) to be **90 kg P/year or 0.6 kg P/ha/year, a 14% reduction in P loss/ha**

Table 1 – Modelling Results

	Lloyds Block 2015/16	Lloyds Block 2016/17	Lloyds Block 2017/18	Lloyds Block 2018/19	Lloyds Block Average
System Type	Dairy support	Dairy support	Dairy support	Dairy support	Dairy support
Area (ha)	27.4	27.4	27.4	27.4	27.4
Nitrogen leaching loss to water (total kg N)	1818	1994	2701	1124	1909
Nitrogen leaching loss to water (kg N/ha)	66	73	99	41	70
Phosphorus runoff to water (total kg P)	10	14	14	10	12
Phosphorus runoff to water (kg P/ha)	0.1	0.5	0.5	0.4	0.45

Table 1a – Modelling Results

	Lloyds Block Average	Piobiare Current	Piobiare Home Blk Current	Combined Result	Combined Result	Proposal
System Type	Dairy support	Dairy support	Dairy support	Dairy support	Dairy support	Dairy support
Area (ha)	27.4	165.1	121.8	192.5	148.9*	148.9
Nitrogen leaching loss to water (total kg N)	1909	4792	3814	6701	5723	4275
Nitrogen leaching loss to water (kg N/ha)	70	29	32	35	38	29
Phosphorus runoff to water (total kg P)	12	121	96	133	108	90
Phosphorus runoff to water (kg P/ha)	0.45	0.7	0.7	0.7	0.7	0.6
% reduction in N						25 %
% reduction in P						17 %

* Note that there is a small rounding error around fno and other areas of 0.3 ha in reconciling the combined areas as described on page 7 of this report.

Key Nitrogen nutrient loss pathways are the N loss from winter grazing of crops, the free draining Waikiwi soils, with the Paroa soils providing a degree of buffering from Nitrogen leaching. Key Phosphate nutrient loss pathways are the P losses from effluent applications and cropping of these heavier silt loams (Paroa). Direct losses to water ways from tile drains are also a major risk to this farm.

Current and proposed key mitigations are;

- the wintering barn (current) and its proposed extended use over the shoulder months in autumn and spring,
- the more than adequate effluent area and storage of effluent which is applied at the most appropriate times when pastures are actively growing,
- the new block (proposed) with its ability to crop meaning an ability to cater for the small increase in farming intensity along with the above factors.

Contents

Executive Summary2

Contents.....4

Abbreviations5

Important Points to Note6

Introduction7

 Property Details8

 Farm Map9

Farm System Analysis 10

 2015/16-2018/19 Year End Farm System (Lloyds block).....10

 Soils.....10

 Soil Fertility.....11

 Stock System Information (Dairy support)11

 Pasture Fertiliser.....12

 Pasture Species and Production12

 Supplements.....13

 Cropping14

 Block History.....15

Summary of Nutrient Loss Indicators..... 15

Farm System Analysis (Scenario of new proposal)..... 16

 Description of new proposed Farm System (with added Lloyds Block).16

Summary of Nutrient Loss Indicators..... 17

Discussion on Nutrient Loss Indicators..... 17

Appendix List..... 19

Abbreviations

General

fno	farmed not owned
onf	owned not farmed
R1	Rising 1 year stock
eff	effluent area
t	tonne
LW	liveweight
c/c	carcass weight
DM	dry matter
pet	potential evapotranspiration

Overseer® FM Blocking Names Protocol

Waiki	Waikiwi
Paro	Paroa

Soils

See Table 3 for Soils Information

Important Points to Note

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Mark Crawford
Senior Farm Environmental Consultant
Dated: 23/01/2020

Introduction

Farm owners Nelson and Roseanne Pyper and Peter Moynihan have requested robust Nutrient budgets, for the purposes of providing information about the nutrient losses and environmental risks, for the property they have recently purchased (Lloyds Block of 27.4 ha) and how this will alter the current supporting information for a land use consent which Aerodrome farm is undertaking, and for which Piobiare is the dairy support block for this operation.

The current Nutrient budget information provided already and reviewed by council has been a current and proposed budget for Piobiare. The changes following this purchase is for Piobiare to relinquish the lease portion of the current property (Lease Block of 43.3 ha).

Four budgets for the 2015/16 season through to the 2018/19 season will represent the farming system for Lloyds block, with the weighted average of these years added to the current budget for Piobiare (including leased block) to reflect the combined losses for both farm systems. A new proposed scenario budget is required, which essentially will be the same modelled system as before but with less land (15.9 ha) which will be used to compare the nutrient losses and environmental risks between the current and future systems.

The farm is located at 939 Lochiel Branxholme Road RD 4 Invercargill and is approximately 15 km from the South west Coast. The new Lloyds block adjoins this block to the south. The total farmed area had been calculated as 165.1 ha. Now the total farmed area is 148.9 ha, 165.1 less the lease of 43.3 ha and 0.3 ha of FNO land plus the 27.4 ha new block.

The new block of 27.4 ha titled, with 25.8 ha being effective and the rest being riparian (0.6 ha) and non-productive (house and lanes), replaces the 43.3 ha which includes 0.9 ha FNO area of the Lease block.

The effective area of all blocks is of flat topography

Overseer[®]FM modelling of the predictive 2019/20 system has been undertaken in accordance with the Overseer[®]FM 6.3.2 (2.9.4.10) "user guide" and has been reviewed by a certified nutrient management advisor. The following report summarises the respective Overseer[®]FM 6.3.2 (2.9.4.10) nutrient budgets and key assumptions made.

Property Details

Table 2 – Property Information

Property	Details
Location address	939 Lochiel Branxholme Road RD 4 Invercargill 9874
Legal description	Lot 2 Deposited Plan 429633 and Section 2 Survey Office Plan 385656 and Section 2 Block III New River Hundred and Part Section 3 Block III New River Hundred; Lot 1 Deposited Plan 517446 and 12462. Lease Block is Lot DP 7084 and Section 30, 39 Block II New River Hundred and Part Section 14-16, 38 Block II New River Hundred. New Block is Lot 1 Deposited Plan 7335, Part Section 13-14 Block II New River Hundred.
Owned area (ha)	120.9 (home) plus 27.4 (Lloyds) = 148.3
Effective area (ha)	114.3 (home) plus 25.8 (Lloyds) = 140.1
Other areas (leased, FNO, ONF)	Other areas 2.5 ha trees, 1.5 ha riparian and 5.1 ha is non-productive plus 0.6 ha FNO
Total farmed area (ha)	121.8 (home) plus 27.4 (Lloyds) =148.9
Topography	Flat
Rainfall (mm/yr)	1110
Temperature (°C)	10.0
PET (mm/yr)	734
Latitude/Longitude	-46.277439 168.305586 for all of the blocks
Distance from coast	15 km

*Climate information is from the climate data tool in Overseer.

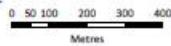
Farm Map

Map 1 – Piobiare with new block (Lloyds)/Farm Paddock Map

Piobiare Homestead



PIOBIARE HOMESTEAD LTD - PYPFR NA & RM - 60827342
 Date printed: 13/01/2020
 0800 73 73 73
www.hawkeye.farm



HawkEye

*

Farm System Analysis

2015/16-2018/19 Year End Farm System (Lloyds block)

The new block was developed over the ensuing 4 seasons, with a cropping programme that started in 14/15, with modelling beginning in the 15/16 season. The main purpose for the block was to manage the yearling heifers over the winter, however one year a herd of dairy cows was also wintered on Kale. The heifer replacement numbers varied, but was originally 120 (dairy farm size), and in the final two years settled on 130 dairy replacements

The replacements arrived some time in autumn (March through to April) and wintered over leaving the property in September. Baleage was made (usually three cuts) and stock could be brought back during this time for brief times in-between the owners run off and dairy properties.

The main crop was Oats under sown with Moata ryegrass, and the regrowth was used to winter the stock. The cereal silage and baleage made on the property largely stayed on for winter, however there were times when baleage was also exported off to the dairy units.

Soils

The soils are described by Landcare S Maps as a Paroa silt loam (Dacre under the Environment Southland Topoclimate series) and a Waikiwi silt loam (Edendale under Topoclimate). The Paroa soil, the main soil is a Gleyed soil and is classed as a deep soil with high plant available water, with a slow-draining topsoil and a slower compact subsoil meaning heavy and prolonged rainfall can cause water and poor aeration during wet periods. They are classed as having moderate versatility accordingly under pastoral farming and given the depth of topsoil's a slight risk to nutrient leaching but a severe vulnerability to waterlogging.

The Waikiwi soil is the reverse, a deep well drained soil with a deep rooting depth and a slow permeable subsoil means short term water logging exists only after heavy rainfall. They are classed as having a high versatility, with a slight vulnerability to waterlogging and a moderate risk to nutrient leaching

Table 3 – Soils Lloyds Block

Sibling Name	Eff Area (ha)	Soil Order	Texture	Drainage	PAW 0-100cm	PAW 0-60cm	PAW 0-30cm
Paroa_4a.1	18.2	Recent Gley	Deep Silt Loam	Poor draining	290.9	177.7	99.3
Waikiwi_30a.1	7.6	Firm Brown	Deep Silt Loam	Well drained	188.6	117.1	63.8
Total	25.8						

Table 3 – Soils New proposed block

Sibling Name	Eff Area (ha)	Soil Order	Texture	Drainage	PAW 0-100cm	PAW 0-60cm	PAW 0-30cm
Paroa_4a.1	89.4	Recent Gley	Deep Silt Loam	Poor draining	290.9	177.7	99.3
Waikiwi_30a.1	51.3	Firm Brown	Deep Silt Loam	Well drained	188.6	117.1	63.8
Total	140.7						

Information sourced from S-Maps

Soil Fertility

Soil test results presented below are averages of results 2017-2018, as per the consent report with default values for the riparian edges grazed by sheep, and Lloyds (new) block in the current budgets, but in the proposal a fertility level the same as the non-effluent parts of the Home block given its recent history of improved pasture:

Table 4 – Soil Fertility

Block	Olsen P	K	Ca	Mg	Na	Org-S
Effluent Block	37	11	9	16	9	13
Non Effluent	34	7	10	13	10	12
Riparian block (default values)	16	7	7	21	8	7
Lloyds Block (proposal)	34	7	10	13	10	12

Stock System Information (Dairy support)

Dairy Replacement Stock

Table 6 – Replacement Stock 15/16 season

Stock class	Start weight (kgLW)	Jul 15	Aug 15	Sep 15	Oct 15	Nov 15	Dec 15	Jan 16	Feb 16	Mar 16	Apr 16	May 16	Jun 16	End Weight (kgLW)
R1 Dairy Replacements	100						120		240	240	240	240	240	210
R2 Dairy Replacements	210	120	120											255

Table 6b – Replacement Stock 16/17 season

Stock class	Start weight (kgLW)	Jul 16	Aug 16	Sep 16	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	End Weight (kgLW)
R1 Dairy Replacements	100						120				120	120	120	210
R2 Dairy Replacements	210	240	240											250
M A Cows	580												535	580

Table 6c – Replacement Stock 17/18 season

Stock class	Start weight (kgLW)	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17	Jan 18	Feb 18	Mar 18	Apr 18	May 18	Jun 18	End Weight (kgLW)
R1 Dairy Replacements	100						130		130	130	130	130	130	210
R2 Dairy Replacements	210	120	120											255
M A Cows	580	267												580

Table 6d – Replacement Stock 18/19 season

Stock class	Start weight (kgLW)	Jul 18	Aug 18	Sep 18	Oct 18	Nov 18	Dec 18	Jan 19	Feb 19	Mar 19	Apr 19	May 19	Jun 19	End Weight (kgLW)
R1 Dairy Replacements	100						130		130	130	130	130	130	220
R2 Dairy Replacements	220	130	130											260

Note: In OVERSEER Stock counts are shown as at the end of each month. Animals will be proportioned according to the actual event dates when calculating results.

- In the 15/16 season, 240 R 1 replacement heifers are bought on to winter (16), with the past winter (15) 120 R2 heifer replacements. R1 replacements are bought on in the 15th December and taken off on the 1st January and coming back on in the 15th February. The R2 heifers are taken off on the 15th September
- In the 16/17 season, 120 replacement heifers are bought on to winter (17) with the 240 R 2 heifer replacements on in the past winter (16). A mob of 535 dairy cows arrive and are wintered for the 17 winter for two months, arriving on the 1st of June. The 120 R1 heifers do not come back until the 15th of April.
- In the 17/18 season 130 R 1 heifers start on the 15th December and arrive back on the 20th February after being taken off on the 1st January. The mob of dairy cows are taken off on the 28th July (268) and 267 on the 3rd August 2017. The 120 past winters R2 heifers are taken off at the usual date
- In the 18/19 season, 130 R 1 replacement heifers are bought on to winter (19), with the past winter (18) 130 R2 heifer replacements. R1 replacements are bought on in the 1st December and taken off on the 1st January and coming back on in the 15th February. The R2 heifers are taken off on the 15th September

Pasture Fertiliser

Fertiliser has been modelled on information sourced from the past owner only. The total fertiliser nitrogen applied is 201 kg N/ha/year (15/16 season) and 256 kg N/ha/year average (rest of the seasons) for the farm blocks and 149 (16/17 season), 163 (17/18 season), 174 (15/16 season) and 178 kg N/ha/year (18/19 season) across all blocks (whole property) on average depending on area and type of cropping

Points to note:

1. Fertiliser applications are based on stated rates, applied across the farm blocks.
2. These rates have been used across all years, as standardised rates, however where a year's pastoral productivity is lower, rates of Nitrogen have been reduced.

Pasture Fertiliser

Table 9 - Fertiliser

Block/Paddocks	Month	Product	Rate kg/ha	
Pastoral Block	August	N Rich Urea	100 or 140	
Pastoral Block	November	Urea/DAP/Sulphur Super 30 and Potash mix	80/150/125/200 or 555	
Pastoral Block	January	N Rich Urea	100 or 140	
Pastoral Block	March	N Rich Urea	100 or 140	
Block	N	P	K	S
	Total kg nutrient ha/yr applied			
Pastoral blocks (15/16)	201	39	100	38
Or for rest of seasons 16 to 19	256	39	100	38

Pasture Species and Production

The predominant pasture species on the farm is ryegrass/white clover. Annual pasture production has been weighted as no difference between blocks. The modelling of cereal crop regrowth is estimated to be 1.8 to 3TDM/ha, which is less than the owners estimation of 4TDM/ha plus, which would account for the higher pastoral production in 16/17(~21TDM) when there is only 1 ha of pasture which the model has assigned all the stock to as grazed pasture, allocating little to the regrowth blocks which are greatest in area in this season, when compared to other seasons.

Table 10 - Pasture

Block Name	Relative Productivity	Overseer [®] FM assumed Utilisation %	Overseer [®] FM Estimated Pasture Production TDM/ha/yr
15/16 pastoral blocks	1	70	10.091
16/17 season pastoral blocks	1	70	21.037
16/17 young grass block	1	70	18.356
17/18 pastoral blocks	1	70	14.681
17/18 young grass blocks	1	70	12.839 to 12.864
18/19 pastoral blocks	1	70	11.462
18/19 young grass block	1	70	9.826

Supplements

Over the 2015-19 period a total of 373 t DM of supplements were either made or imported and fed out on farm, however 230 tonne of this was from cereal baleage exported and then modelled as re-imported, with one year an additional 250 t DM of baleage imported in.

Points to note:

1. Most baleage was fed on crop paddocks or regrowth areas according to the farmer, have modelled to specified blocks in crop where possible, the rest is fed to cattle grazing.
2. Bales of baleage entered at 225kgDM/bale, harvested in October, December. and February months at between 2.1 to 3.5 t DM/ha, or twice (Dec, Feb) and 1.8 t DM/ha for Young grass paddocks.
3. There were instances of cereal baleage being exported off farm, so have re imported an amount whilst being mindful of pastoral productivity, with the remainder being left exported depending upon area and yield available that year. See “cropping” section for more information on the crops and yields.

Table 11 – Supplements Fed (imported and made on farm)

15/16 season

Supplements	Source	Amount (TDM)	Destination	Months Fed
Cereal baleage made & re imported	Imported	40	Cattle grazing blocks	May to September on crop blocks (10,30,30,20 & 10 % respectively)
Baleage (131 bales)	Made on farm	29	Cattle grazing blocks (33)	Evenly distributed

16/17 season

Supplements	Source	Amount (TDM)	Destination	Months Fed
Cereal baleage made & re imported	Imported	80	Cattle grazing blocks (50) & crop blocks (30)	May to September on grazing blocks (10,30,30,20 & 10 % respectively) or evenly distributed
Baleage (19 bales)	Made on farm	4	Cattle grazing blocks (11)	Evenly distributed
Baleage (250 bales)	Imported	55	Cattle grazing blocks (100) & pasture blocks (150)	Evenly distributed or May to September on crop blocks (10,30,30,20 & 10 % respectively)

17/18 season

Supplements	Source	Amount (TDM)	Destination	Months Fed
Cereal baleage made & re imported	Imported	80	Cattle grazing blocks (30) & crop blocks (50)	Evenly distributed or May to September on crop blocks (10,30,30,20 & 10 % respectively)
Baleage (104 bales)	Made on farm	22	Cattle grazing blocks (11) & crop blocks (11)	Evenly distributed

18/19 season

Supplements	Source	Amount (TDM)	Destination	Months Fed
Cereal baleage made & re imported	Imported	30	Cattle grazing blocks	May to September on crop blocks (10,30,30,20 & 10 % respectively)
Baleage (149 bales)	Made on farm	33	Cattle grazing blocks (33)	Evenly distributed

Cropping

The main pastoral cropping sequence for the 15/16 to 18/19 seasons was a spring Oats crop under sown with Moata ryegrass, and after the cereal baleage has been harvested regrowth used to winter the yearling heifers. There was a season when Barley and peas was sown, and another season when Kale was cropped as a means to winter dairy cows. Soft turnips sown with Moata was also done for one autumn. All these crops are shown in the cropping cycles, however both yields and fertiliser has been averaged and standardised across the seasons, according to the information provided by the past owner. The following crops modelled are:

Kale (16.3ha) – 16/17 season in Paddocks 7-9 and 4-5.

- Sown in December (cultivated)
- Sown with Cropmaster DAP at 125 kg/ha (22kgN/ha; 25kgP/ha; 1kgS/ha)
- Side dressing of 69kgN/ha in January and March
- Average yield 12TDM
- Grazed by cattle in May, June and July.
- Sown into Barley/Peas ex fallow in October (cultivate).

Oats (12.3, 6.2, and 9.7ha) – 15/16, 16/17 and 18/19 seasons in Paddocks 4-5, 6 and part 3(0.67), 2 6 and part3(0.33) and 7-9 respectively.

- Sown in October (cultivated)
- Sown with Cropmaster DAP at 125 kg/ha (22kgN/ha; 25kgP/ha; 1kgS/ha)
- Side dressing of 69kgN/ha in December and February
- Average yield 8TDM
- Harvested February by cut and carry and exported off.
- Sown into Annual ryegrass forage in March (direct drilled) and grazed only to represent regrowth.

Soft Turnips (8.9ha) – 15/16 season in Paddocks 4-5, part 3(0.67).

- Sown in March (minimum tillage) ex oats
- Sown with nil fertiliser
- Side dressing of 69kgN/ha in March when crop struck.

- Average yield 5TDM
- Grazed May and June by cattle.
- Sown into Annual ryegrass forage in July (direct drilled) and grazed only to represent regrowth

Barley Peas (16.3ha) – 17/18 season in Paddocks 4-5 and 7-9.

- Sown in Oct (cultivation) ex fallow after Kale
- Sown with Cropmaster DAP at 125 kg/ha (22kgN/ha; 25kgP/ha; 1kgS/ha)
- Side dressing of 69kgN/ha in December and February
- Average yield 9TDM
- Harvested February by cut and carry and exported off.
- Sown into Annual ryegrass forage in March (direct drilled) and grazed only to represent regrowth

Block History

For the 10 year period prior to the reporting year, the number of years a block is in pasture needs to be entered into Overseer[®]FM. This provides an indication of how much nitrogen has accumulated in the soil under a grazed pastoral system, grass seed crops and from clover N fixation. A block history of 6, was modelled based on the years in crop relative to pasture, based on. 3 years for the 5 years owned and an estimated 8 year block history prior to this.

Summary of Nutrient Loss Indicators

Table 12 – Modelling Results

	Lloyds Block 2015/16	Lloyds Block 2016/17	Lloyds Block 2017/18	Lloyds Block 2018/19	Lloyds Block Average*
System Type	Dairy support	Dairy support	Dairy support	Dairy support	Dairy support
Area (ha)	27.4	27.4	27.4	27.4	27.4
Nitrogen leaching loss to water (total kg N)	1818	1994	2701	1124	1909
Nitrogen leaching loss to water (kg N/ha)	66	73	99	41	70
Phosphorus runoff to water (total kg P)	10	14	14	10	12
Phosphorus runoff to water (kg P/ha)	0.1	0.5	0.5	0.4	0.45

*Please note that results have been averaged over the four years/seasons to arrive at the block average

Farm System Analysis (Scenario of new proposal)

Description of new proposed Farm System (with added Lloyds Block).

The farm is still proposed to be *used solely for the carrying of the Aerodrome dairy farm increased numbers of wintered dairy cows and young stock*. The effluent area (90.7 ha) and wintering barn capacity remains the same, with the added ability to use the wintering barn over the May and September periods *for other dry stock*. The cropping area is to remain on the home block and the effluent block mainly, with the *additional cows and heifers wintered on a slightly increased crop area which is averaged pro rata across the two key soil types*. There will be *18 ha of fodder beet grown*. Essentially the new block alters the portion of the two soils cropped, with it now being 6 ha of Paroa soils and 3 ha of Waikiwi soils compared to 5.3 and 3.7 ha respectively. All detail is as contained in the prior report written.

Due to the reduced area, of 15.9 ha, a slight increase in the stocking rate with adjusted supplement made increased by 8 t DM (600 compared to 592) alters pastoral productivity to be more in line with the past productivity. This was done, as the lease block pasture was not able to be renewed (no cropping as part of the conditions of lease) but now the whole property can be renewed with a slightly greater portion of the total farmed area in crop each year and this reflects in the added productivity as seen by the pasture production table below;

Table 13 - Pasture

Block Name	Relative Productivity	Overseer®FM assumed Utilisation %	Overseer®FM Estimated Pasture Production TDM/ha/yr
Piobiare current	1	70	13.105 & 11.794
Lloyds Block weighted average	1	70	14.317*
Piobiare Old proposal (with Lease)	1	70	12.365 & 11.129
Piobiare New proposal (with Lloyds)	1	70	13.749 & 11.147

* Note that this includes one inflated year of approximately 21 T DM/ha, however the other three years calculate to 12.078 T DM/ha, still within the boundary of both current and proposed pasture productivity.

Summary of Nutrient Loss Indicators

Table 14 - Nutrient Loss Indicators combined

	<i>Lloyds Block Average</i>	<i>Piobiare Current</i>	<i>Combined Result*</i>	<i>Proposal</i>
System Type	Dairy support	Dairy support	Dairy support	Dairy support
Area (ha)	27.4	165.1	192.5	148.9
Nitrogen leaching loss to water (total kg N)	1909	4792	6701	4275
Nitrogen leaching loss to water (kg N/ha)	70	29	35	29
Phosphorus runoff to water (total kg P)	12	121	133	90
Phosphorus runoff to water (kg P/ha)	0.45	0.7	0.7	0.6

*Please note there can be small differences between N and P losses totalled for the individual blocks and the total given for the whole farm. This is due to internal Overseer®FM modelling.

Discussion on Nutrient Loss Indicators

From the information provided by Nelson, Roseanne and Chris on behalf of Piobiare Homestead Ltd, information from farm records, and the assumptions listed above, the N loss from the root zone and P loss to second order streams for the current modelled farm system is outlined below.

- The N loss from the root zone from the **current farm system (adjusted to new version)** was calculated using Overseer®FM 6.3.2 (2.9.4.10) to be **4,792 kg N/year or 29 kg N/ha/year**.
- The N loss from the root zone from the **combined farm system (adjusted to new version plus purchased block)** was calculated using Overseer®FM 6.3.2 (2.9.4.10) to be **6,701 kg N/year or 35 kg N/ha/year**
- The N loss from the root zone from the **new proposed farm system** was calculated using Overseer®FM 6.3.2 (2.9.4.10) to be **4,275 kg N/year or 29 kg N/ha/year, a 17 % reduction in N loss/ha**
- The P loss from the root zone from the **current farm system (adjusted to new version)** was calculated using Overseer®FM 6.3.2 (2.9.4.10) to be **121 kg P/year or 0.7 kg P/ha/year**.
- The P loss from the root zone from the **combined farm system (adjusted to new version plus purchased block)** was calculated using Overseer®FM 6.3.2 (2.9.4.10) to be **133 kg P/year or 0.7 kg P/ha/year**
- The P loss from the root zone from the **new proposed farm system** was calculated using Overseer®FM 6.3.2 (2.9.4.10) to be **90 kg P/year or 0.6 kg P/ha/year, a 14% reduction in P loss/ha**.

The key influences on Nitrogen loss are as noted in the previous report and briefly noted here:

Grazing on fodder beet crop

The concentrations of urinary N on crops deposited with a moderate stocking rate during winter months may result in a high nitrogen load; thereby increasing the risk of N loss. This can still be demonstrated by the high N loss value for the Waikiwi crop blocks under the new proposal with the rotation of FB to FB, and Pasture to FB, in comparison to the Paroa blocks of the same rotation, with losses being 110 and 94 kg N/ha/year and 82 and 71 kg N/ha/year

respectively. In total, the crop blocks and young grass paddocks contribute 1,173 kg N/year or 42 % of the total N loss for the proposed system.

Soil type and Potential Available Water (PAW)

The soil type has a large impact on N leached. The pastoral blocks with the highest N losses were the Waikiwi_30a.1 soil blocks due to the lower Potential Available Water (PAW) compared to the heavier and slower draining Paroa_4a.1 soils.

Pastoral productivity

The higher the pastoral productivity from pastoral land and the associated higher stocking, the higher the risk of N losses on farms, especially under the climatic, rainfall and evapotranspiration rates for Southland.

The key influences on P loss for the farm system are discussed below:

The overall P loss risk is low to moderate, still at 121 kg P/year or 0.7 kg P/ha/year for the current system but 90 kg P/year or 0.6 kg P/ha/year for the new proposal. This is due to the mostly flat topography and soil type. On a kg P/ha/year basis, the majority of the P losses still arise from the gleyed soil (Paroa) under cropping or being applied with effluent solids and sludge (39 and 41 kg P/year respectively). These losses can be mitigated with riparian plantings which can remove any sediment before reaching water ways. Reducing stock treading and optimal P levels within these soils are also important factors and are current management practices being used by the current owners. Other sources (19 and 14 kg/year) of P loss are lanes and races. Riparian strip planting and vegetation buffer zones again are potential mitigation solutions to reduce this runoff.

The current baseline and proposed scenario is rated 7.95 and 6.57 respectively, the mid side of category 1 (1 to 12) under the Soil versatility rating system (Landcare Research, 2002), as calculated in the table 4 below.

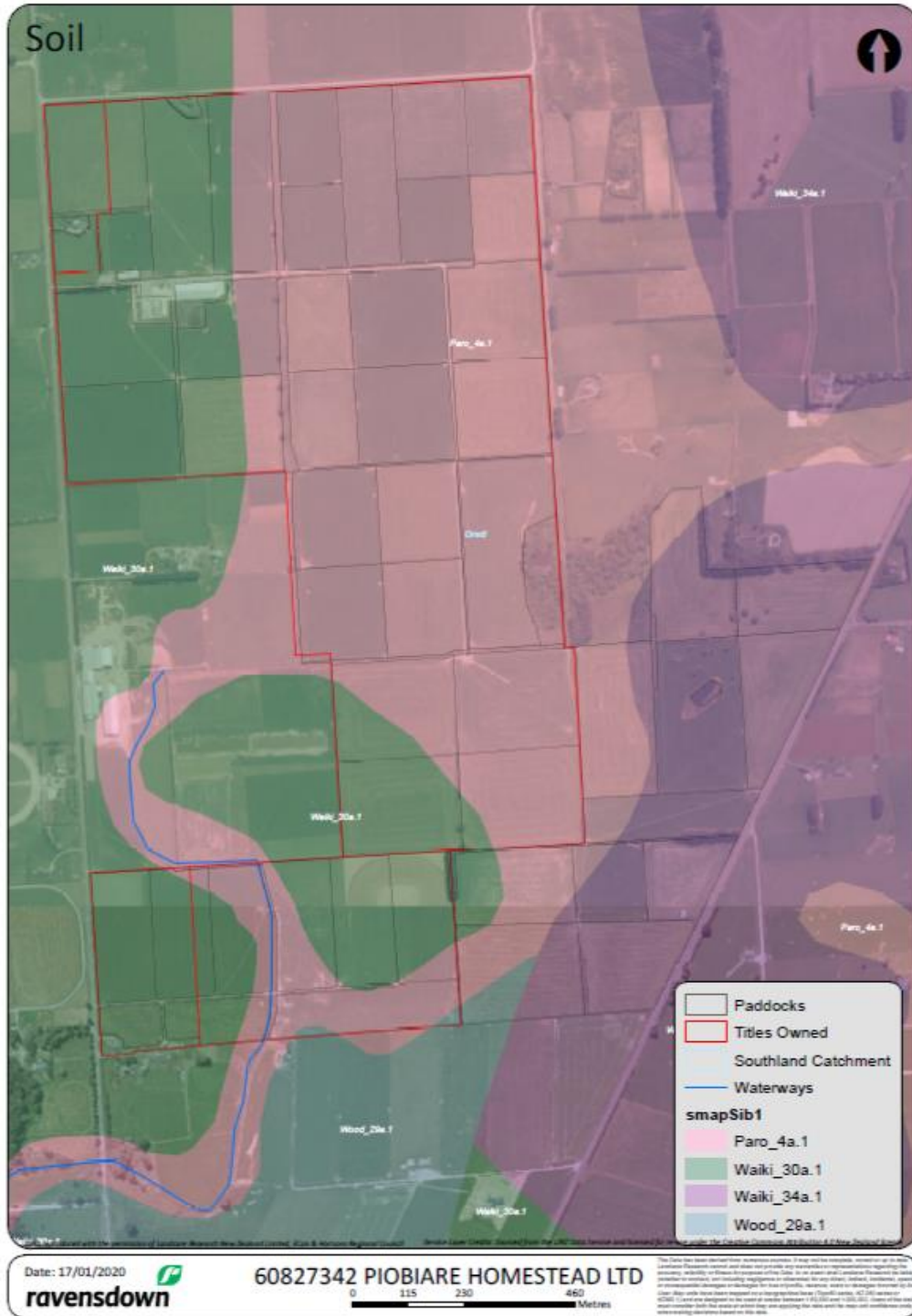
Soil Vulnerability Land Management Rating and Physiographic Zones: Table 4

Soil Type (current)	Soil type (proposal)	Physiographic Zone	Soil Vulnerability	Vulnerability rating	% Farm current	Rating score	% Farm proposal	Rating score
Paroa_4a.1 aka. Dacre	Paroa_4a.1 aka. Dacre	Gleyed No variant	Moderate	10	58.1	5.81	63.0	6.3
Waikiwi_30a.1 aka. Edendale	Waikiwi_30a.1 aka. Edendale	Oxidising No variant	High	1	23.1	0.23	27.0	0.27
Waikiwi_34a.1	n/a	Oxidising Variant artificial drainage	Moderate	10	18.1	1.81		
Woodlands_29a.1	n/a	Oxidising No variant	Moderate	10	0.7	0.1		
Total					100.0	7.95	100	6.57

The key risks are the overland flow from the Gleyed soils and compaction during winter, with deep drainage being the key risk for the Waikiwi. The greater use of the winter barn and the current riparian plantings are effective mitigations for the current and proposed systems, with the changes modelled showing a 14 to 17 % reduction in P and N loss figures on a per ha basis, despite a small increase in intensification.

Appendix List

Maps: Soil and Block Maps



Crop Rotations

Overseer®FM Output

Farm Details

Farm Results

Analysis Comments

Blocks

Farm Soils

Enterprises

Supplements

Crops

Fertiliser

Irrigators

Structures/Effluent System

Nutrient Budgets

Effluent Report



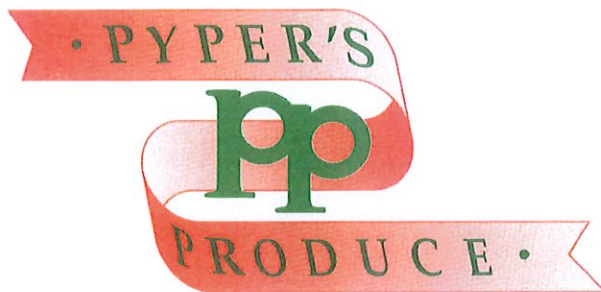
Crop Rotations

Area		Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	
1	Paddock 1	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass
1.6	Paddock 2	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	O/M rgrwth	O/M rgrwth	O/M rgrwth	O/M rgrwth
9.7	Paddock 7-9	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Kale	Kale	Kale	Kale	Kale	Kale	Kale	Kale	Kale
6.6	Pdk 4-5	O/M rgrwth	O/M rgrwth	O/M rgrwth	O/M rgrwth	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	SoftT/Moa	SoftT/Moa	SoftT/Moa	SoftT/Moa	Moata rgrv	Moata rgrv	Moata rgrv	Kale	Kale	Kale	Kale	Kale	Kale	Kale	Kale	Kale	Kale
3.4	Pdk 6	Grass	Grass	Grass	Grass	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	O/M rgrwth	O/M rgrwth	O/M rgrwth	O/M rgrwth	O/M rgrwth	O/M rgrwth	O/M rgrwth	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	O/M rgrwth	O/M rgrwth	O/M rgrwth	O/M rgrwth
1.2	0.33 Pdk 3	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	O/M rgrwth	O/M rgrwth	O/M rgrwth	O/M rgrwth
2.3	0.67 Pdk 3	O/M rgrwth	O/M rgrwth	O/M rgrwth	O/M rgrwth	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	SoftT/Moa	SoftT/Moa	SoftT/Moa	SoftT/Moa	Moata rgrv	Moata rgrv	Moata rgrv	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass
25.8		grass		13.5	crop	12.3	as at oct								grass	3.3	crop	22.5	as at oct								
	R1 Hfr				oats	12.3		120		240	240	240	240	240				kale	16.3		120				60	120	120
	R2 Hfr		120	120	softs	8.9									240	240	oats	6.2									
	MA cows																									535	

Area		Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	
1	Paddock 1	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass
1.6	Paddock 2	O/M rgrwth	O/M rgrwth	O/M rgrwth	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass
9.7	Paddock 7-9	Kale	fallow	fallow	Barley/Pea	Barley/Pea	Barley/Pea	Barley/Pea	Barley/Pea	BrllyPea rg	BrllyPea rg	BrllyPea rg	BrllyPea rg	BrllyPea rg	BrllyPea rg	BrllyPea rg	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	Oats/Moat	O/M rgrwth	O/M rgrwth	O/M rgrwth	O/M rgrwth	O/M rgrwth
6.6	Pdk 4-5	Kale	fallow	fallow	Barley/Pea	Barley/Pea	Barley/Pea	Barley/Pea	Barley/Pea	BrllyPea rg	BrllyPea rg	BrllyPea rg	BrllyPea rg	BrllyPea rg	BrllyPea rg	BrllyPea rg	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass
3.4	Pdk 6	O/M rgrwth	O/M rgrwth	O/M rgrwth	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	
1.2	0.33 Pdk 3	O/M rgrwth	O/M rgrwth	O/M rgrwth	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	
2.3	0.67 Pdk 3	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	Grass	
25.8		grass	9.5	crop	16.3	as at oct								grass	16.7	crop	9.7	as at oct									
	R1 Hfr			barley/pea	#REF!		130		130	130	130	130	130			oats	9.7		130		130	130	130	130	130		
	R2 Hfr	120	120											130	130											130	
	MA cows	535																									

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Overseer® FM Output
See attached pdf formats



Branxholme No. 4 R.D.
INVERCARGILL 9874
Phone 03-221 7277
Fax 03-221 7188

Potato and Carrot Growers

14th April 2020

Piobaire Homestead – Consent

We are happy to remove any discharge consent (current or applied for) to the blocks of land that are owned by Piobaire Homestead. We have advised Environment Southland to remove this from our consent.

Regards
Brendan Hamilton

Pypers Produce Ltd
DIRECTOR